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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/756,553	01/13/2004	James G. Shepard	PD-02W173	2675

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EXAMINER	
BOWERS, NATHAN ANDREW	
ART UNIT	PAPER NUMBER
1744	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/20/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/756,553	SHEPARD ET AL.	
	Examiner	Art Unit	
	Nathan A. Bowers	1744	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 August 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5,11-14 and 19-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5, 11-14 and 19-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 25 August 2006 has been entered.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any

evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

1) Claims 1-4, 11-14, 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Silcott (US 20030098422) in view of Spremo (US 6930775), and optionally further in view of Cramp (US 4490043).

With respect to claims 1 and 3, Silcott discloses a bioagent detecting system comprising a laser source (Figure 3:106) for generating ultraviolet light to fluoresce an aromatic protein. This is disclosed in paragraphs [0044]-[0051]. Furthermore, a detector (Figure 4:412) and a system controller (Figure 16:1604) are provided for sensing induced fluorescence from the protein and correlating the detected fluorescence levels with atmospheric absorption levels to determine if an ambient threshold is exceeded by a predetermined amount. This is disclosed in paragraphs [0085]-[0095]. Silcott discloses a plurality of output couplers (Figure 4:414) in the form of lenses coupled to the light source to direct light to the detection site. Silcott, however, does not expressly state that a blaze grating is provided to separate UV light provided by the laser source into first and second wavelengths having a separation therebetween of no more than five nanometers.

Spremo discloses a biological detection system in which a light source and a detector are provided. In column 1, line 26 to column 2, line 25 and in column 4, lines 33-67, Spremo indicates that a plurality of blaze gratings are provided to separate wavelengths from the light source into first and second wavelengths each capable of being directed onto a detection site.

Column 11, lines 5-16 state that wavelength separation between the pair is 1-20 nm, or less if desired.

Silcott and Spremo are analogous art because they are from the same field of endeavor regarding the use of a light source and a photodetector to detect fluorescence in a biological analyte.

At the time of the invention, it would have been obvious to include the blaze grating disclosed by Spremo in the optical detection system proposed by Silcott. In column 1, lines 12-35, Spremo indicates that it is advantageous in detection systems to divide light derived from the light source into separate beams comprising distinct wavelengths in order to better study certain wavelength effects. In the system of Silcott, this would have allowed one to ensure that detected fluorescence is derived from the presence of an analyte, rather than from background fluorescence produced from interaction with wavelengths that are not specific to the analyte.

It is noted that claim 1 includes the limitation "wherein the first and second ultraviolet wavelengths comprise a pair of ultraviolet wavelengths selected to have different absorption levels for the aromatic protein which are substantially unaffected by atmospheric levels of the aromatic protein." This statement does not further limit the claim since it, like other statements regarding the use of the device, simply describes an exemplary way in which the apparatus can be operated. However, in order to further the prosecution of the instant application, Cramp (US 4490043) is cited to show that these limitations are obvious.

Cramp discloses a method and apparatus for remotely monitoring the presence of an analyte through the air using two distinct wavelengths emitted from a light source. The selected

wavelengths have different absorption levels for the analyte in question, however the atmospheric absorption levels for the wavelengths of the pair are substantially the same. In this way, a correlation between first and second emitted radiation levels with known atmospheric absorption levels can be used to determine if analytes are present. This is disclosed in column 1, lines 1-41 and in column6, lines 32-51.

At the time of the invention, it would also have been obvious to ensure that the plurality of laser diodes disclosed by Silcott and Spremo are use to produce a pair of wavelengths that interact with the analyte in question differently, but exhibit similar atmospheric absorption levels. In column 1, lines 1-41 and throughout the reference, Cramp indicates that this method of use if beneficial because it allows one to "obtain the ratio of the isolated signals corresponding to radiation collected from a detection beam and a related reference beam" in order to provide an accurate measure of the analyte in a suspect cloud.

With respect to claims 2, 19 and 20, Silcott, Spremo and optionally Cramp disclose the apparatus set forth in claim 5 as set forth in the 35 U.S.C. 103 rejection above. In addition, Silcott states in paragraph [0071] that the detector comprises avalanche photo diodes to detect fluorescence levels. Silcott states in paragraphs [0058] and [0059] that the UV laser light is collimated by lenses. The collimator intrinsically could collimate the laser light for direction toward a suspect cloud in the atmosphere.

With respect to claims 4, 11 and 12, Silcott, Spremo and optionally Cramp disclose the apparatus set forth in claim 1 as set forth in the 35 U.S.C. 103 rejection above. Furthermore,

Silcott teaches in Table 2 and paragraphs [0051]-[0054] that tryptophan fluoresces at 320-350 nm, and therefore should be irradiated with UV light of 220, 280 and 288 nm. Silcott states in paragraph [0085] that anthrax is detected using the disclosed invention. Anthrax has an aromatic-protein shell comprising tryptophan, and therefore can be quantified by detecting tryptophan fluorescence.

With respect to claims 13 and 14, Silcott, Spremo and optionally Cramp disclose the apparatus set forth in claim 5 as set forth in the 35 U.S.C. 103 rejection above. In addition, Silcott teaches in paragraphs [0085]-[0095] that the system controller receives a detection signal from the detector that is proportional to the fluorescence level, and that a notification signal is generated when the detection signal indicates that a threshold is exceeded. The threshold is based on a predetermined value that corresponds to a standard condition.

2) Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Silcott (US 20030098422) in view of Spremo (US 6930775) and Cramp (US 4490043) as applied to claim 1, and further in view of Dai (US 20030230728).

Silcott, Spremo and Cramp disclose the system set forth in claim 1 as set forth in the 35 U.S.C. 103 rejection above, however do not expressly indicate that the laser source comprises an array of laser diodes. Although Spremo indicates in column 3, lines 8-11 that the use of multiple light sources is known in the art, Spremo does not state that a laser diode array is used.

Dai discloses a bioagent detecting system and method comprising a first array (Figure 3:104a) of light emitting diodes (LED) for generating a first ultraviolet wavelength and a second

array (Figure 13:104b) of LEDs for generating a second ultraviolet wavelength. This is disclosed in paragraphs [0008]-[0015] and [0032]. Paragraphs [0032]-[0037] indicate that the individual diodes on each array may be configured to emit light at different UV wavelengths, or may be divided into separate groups that each generate light at more than one UV wavelength. A third array (Figure 3:104c) may be used to generate light at a plurality of different wavelengths. It is believed that the diode arrays disclosed by Dai are capable of generating a pair of discrete UV wavelengths in such a way that each array generates light at a separate and single wavelength. Furthermore, it is believed that Dai's invention is capable of illuminating and inducing fluorescence in a single sample using the first and second wavelengths. These limitations merely represent intended uses of the device (See MPEP 2114).

At the time of the invention, it would have been obvious to substitute the single laser diode disclosed by Silcott with a plurality of laser diodes arranged across multiple arrays. This would allow one the ability to simultaneously and sequentially irradiate a biological sample with UV light at a plurality of different wavelength. In paragraph [0020], Dai states that this is advantageous because it allows one to easily detect fluorescence at a variety of excitation wavelengths in a quick and efficient manner. By incorporating a plurality of individually controlled laser diodes, Silcott's device would be capable of simultaneously analyzing a sample for the presence of a plurality of hazardous bioagents that fluoresce at different wavelengths.

3) Claims 21 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Silcott (US 20030098422) in view of Spremo (US 6930775) and optionally Cramp (US 4490043) as applied to claims 15 and 20, and further in view of Petrich (US 20030160182).

Silcott, Spremo and Cramp disclose the apparatus set forth in claims 15 and 20 as set forth in the 35 U.S.C. 103 rejections above, however do not expressly disclose that the apparatus comprises a range finder, or that the apparatus is handheld.

Petrich discloses an apparatus that comprises a plurality of light sources (Figure 4:110) that emit ultraviolet light in order to cause a hazardous bioagents upon a sample (Figure 1:140) to fluoresce. This resulting fluorescence is detected by a sensor (Figure 4:130) which relays information to a processor (Figure 4:117). This is disclosed in paragraphs [0015] and [0032]-[0038]. Petrich teaches that the device is handheld and is adapted to receive batteries. Paragraph [0039] teaches that the apparatus further includes a proximity sensor (Figure 4:122) that is capable of determining the distance to a biological sample.

Silcott, Spremo, Cramp and Petrich are analogous art because they are from the same field of endeavor regarding the use of fluorescence to determine the presence of undesirable biological compounds.

At the time of the invention, it would have been obvious to construct the apparatus proposed by Silcott and Spremo as a handheld device. Petrich teaches in paragraphs [0003] and [0011] that handheld devices are lightweight and portable, and are useful because they can be easily transported to any place that requires the detection of a biologically dangerous compounds. This type of portable device is necessary to analyze a suspect cloud that may materialize anywhere and at any time. Furthermore, it would have been obvious to provide the invention with a range finder. Petrich teaches in paragraph [0039] that a range finder is beneficial because it can be used to restrict UV radiation if the object to be analyzed is determined to not be within the light path or not be within a certain distance from the light

source. This is advantageous because it provides increased safety to the user by reducing any unintended and unnecessary exposure to the light source.

4) Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Silcott (US 20030098422) in view of Spremo (US 6930775) and optionally Cramp (US 4490043) as applied to claim 5, and further in view of Reichert (US 6911344) or Giebeler (6313471).

Silcott, Spremo and Cramp disclose the apparatus set forth in claim 5 as set forth in the 35 U.S.C. 103 rejection above. Silcott discloses tunable fiber lasers, however do not disclose that a blaze grating is used to receive multiple wavelength light from the array of diodes and direct a selected wavelength through an output coupler.

Reichert and Giebeler disclose apparatuses for facilitating fluorescence detection of biological compounds. Reichert states in column 2, line 64 to column 3, line 41 that blaze gratings and output couplers are known in the art as effective ways to select a desired wavelength. Giebeler discloses the use of blaze gratings in column 6, lines 9-24 and in column 8, lines 29-45.

Silcott, Spremo, Cramp, Reichert and Giebeler are analogous art because they are from the same field of endeavor regarding fluorescent detection procedures.

At the time of the invention, it would have been obvious to add a blaze grating and an output coupler to the apparatus disclosed by Silcott and Spremo. Blaze gratings and output couplers are well known in the art and are effective mechanisms to direct light of a desired wavelength to a detector. Multi-wavelength light derived from the laser disclosed by Silcott

could easily be manipulated using a blaze grating and an output coupler based on a control signal from a system controller.

Response to Arguments

Applicant's arguments filed 25 August 2006 with respect to the 35 U.S.C. 103 rejections involving the combination of Silcott, Dai and Cramp have been fully considered and are persuasive. Therefore, these rejections have been withdrawn. However, upon further consideration, a new ground of rejection is made in view of the combination of Silcott, Spremo and Cramp.

Spremo clearly addresses the deficiencies of the Silcott reference by indicating that it is known in the art to utilize blaze gratings in optical detection systems. As taught by Spremo, the use of blaze gratings provides an effective way to divide an excitation beam and in order to study specific wavelength effects during detection.

Conclusion

This is a non-final rejection.

No claims are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nathan A. Bowers whose telephone number is (571) 272-8613. The examiner can normally be reached on Monday-Friday 8 AM to 5 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gladys Corcoran can be reached on (571) 272-1214. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

NAB

GLADYS JP CORCORAN
SUPERVISORY PATENT EXAMINER